

1. The specification is objected to under 37 CFR 1.71 and claims 24-31 are rejected under 35 U.S.C. § 112, first paragraph. The Office Action indicates that FIG. 1 only shows a robot with the arm movement in angular positions in a three dimensional space called a "work volume" in the specification and that the specification fails to clearly define the "haptic interface" and "work volume" calibration, other than angular measurement as shown in FIGS. 2A-2E and FIG.

7.

For clarification and as discussed with the Examiner, FIG. 1 depicts a haptic interface, which is the environment the claimed invention operates within. Haptic interfaces are well known in the art. See, for example, the Zilles patent. FIGS. 2A-2E depict components/axes of the haptic interface, in particular a cable tensioning system for use with the haptic interface of FIG. 1. FIG. 7 depicts a schematic of a portion of a circuit board disposed in a user connection element. The methods and systems for calibrating the workspace volume of the haptic interface are disclosed at page 18, line 22, to page 20, line 6, of Applicants' specification. Further, FIGS. 4A and 4B depict at least portions of the workspace volume calibration system.

As discussed with the Examiner, Applicants are amending the claims to recite "workspace volume" consistently throughout the claims. The term workspace is commonly known and used by those skilled in the art. See, for example, references C3-C6 of the accompanying supplemental information disclosure statement. Specifically, "[w]orkspace is a volume of space which the end-effector of the manipulator can reach. Workspace is also called work volume or work envelope." *Robotics Research Group home page*, <http://www.robotics.utexas.edu/> at www.robotics.utexas.edu/rrg/education/low_education/

above, Zilles discloses method and apparatus for determining forces to be applied to a user through a haptic interface; however, Zilles fails to disclose anything with respect to **calibrating a workspace volume**. In addition, Zilles fails to teach or suggest *rotating a rotary element, tracking an angular orientation of the rotary element, determining a home position for the rotary element, or comparing the angular orientation of the rotary element with respect to the home position of the rotary element*, as required in amended claim 24. Buote fails to cure the deficiencies of Zilles. Specifically, Buote is concerned with the angular position of a rotary mechanism, but fails to disclose any application to a haptic interface or a method or system for **automatically calibrating a workspace volume**. Further, Buote fails to teach or suggest *initializing a position of the haptic interface or geometrically centering a user reference point in a workspace volume*, as required in amended claim 24. Applicants, therefore, submit that neither Zilles nor Buote, alone or in proper combination, provides the teaching, suggestion, or motivation for one skilled in the art to arrive at the automatic workspace volume calibration method, as claimed in amended independent claim 24, or the system for automatic workspace volume calibration, as claimed in amended independent claim 30. Because claims 26-29 and 31-34 depend directly from either claim 24 or claim 30, they are patentable as a matter of law.

Alternatively, neither Zilles nor Buote contain the necessary suggestion or motivation to make the combination. To establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available in the art, to modify the reference or to combine reference teachings. The teaching or suggestion to make the claimed combination must be found in the prior art and not based on Applicant's disclosure. See generally, *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir.

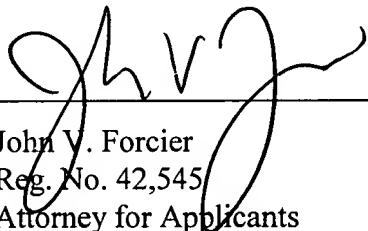
1991) and MPEP § 706.02(j). Applicants respectfully submit that, because Zilles is directed to generating force-feedback to a haptic interface user and Buote is directed to determining an angular position of a robot, which are unrelated, there is no motivation to combine the references. Neither Zilles nor Buote is concerned with calibrating a workspace volume. The claims are therefore patentable for this reason as well.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 24-31 under 35 U.S.C. § 103(a), as being unpatentable over Zilles in view of Buote.

CONCLUSION

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of all objection and rejections and allowance of claims 24 and 26-34 in due course. The Examiner is invited to telephone the undersigned attorney to discuss any outstanding issues.

Respectfully submitted,



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